

SPEED Stat: a free spreadsheet program for classical statistical analysis

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SPEED Stat is a free spreadsheet program for statistical analysis. It has been developed with minimalist concepts so SPEED Stat will allow you to do the essential in a very simple and intuitive way. The SPEED Stat performs parametric statistical analyzes that have wide application to agricultural experimentation. It analyzes balanced or unbalanced data from experiments conducted in RBD or CRD. SPEED Stat's analysis capacity is limited to up to 40 treatments (uni-factorial), 86 treatments (bi-factorials with up to $10 \times 8 + 6$ treatments) or 486 treatments (tri-factorials with up to $10 \times 8 \times 6 + 6$ treatments). The maximum number of replicates supported per treatment is eight. It also analyzes experiments in split plots and split blocks with or without additional treatments.

In a simple, fast and intuitive way, it performs analysis of variance (fixed effects), tests for normality, homoscedasticity, additivity, outliers, complex contrasts (one-sided Bonferroni, Dunn-Sidak and Holm-Bonferroni), tests of means (Tukey, SNK, Dunnett, Scott-Knott), descriptive statistics (including the measure of effect size d-Cohen), and regression analyzes for linear and non-linearizable models. The program also scans by transformations and offers rank transformation (RT and RT-2) with aligned rank (ART) for the effect of the interaction in double factorials. Finally, it performs a type os Nested ANOVA, a type of ANOVA for repeated measurements and allows the setting of external error values and degrees of freedom of the residue to perform other analyzes.

Program highlights:

- Simple language, in three languages, without excess of “complex statistical terms”;
- Directly in Excel, with all its editing, formatting and migration facilities to other Office suite applications (which can generate 'tiff' figures at 600 dpi, for example);
- The tests of the assumptions (normality, homoscedasticity and additivity) and outliers are performed automatically, without the user having to understand details of the particularities of the model. When an assumption is violated, the program automatically looks for a suitable transformation;

- Easier to perform ANOVA and mean tests for models in split-plot, split block, nested and repeated measures because the program correctly selects the MSresidue and the DF to be used. In addition, in factorials, the program formats the table of averages, joining uppercase and lowercase letters (Ab, ABa, ...) and plotting them directly on the graph;
- Greater simplicity to analyze unbalanced (missing data) or factorial data with additional treatments (including regression with extra treatments);
- Easier to perform regression analysis, including for nonlinear models. The regression plots are already pre-formatted and the program derives the equations or isolates the 'x' term from the models to report maximum points, asymptotes, etc.

Program limitations:

- Includes only the most common procedures in agricultural research;
- The maximum number of repetitions per treatment is only 8 (a problem that can, in part, be circumvented by the use of analytical replicas or by fractioning the sampling plan);
- Does not perform correlation analysis (correlation matrix) or multivariate analysis procedures (except simple multivariate indices);
- It is demanding on hardware configurations for fast processing of calculations and works only in Microsoft Office.

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